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Food Insecurity in Yemen

A safe place to live has been a necessity in human society since the beginning of time. Nearly 7.6 billion people crave to have a roof over their head, but what happens when the concept of home is compromised? What happens when healthcare, clean water, and adequate nutrition become unavailable? When conflict arises in a country, masses of people have to become expatriates and look for a safe haven. When that conflict involves both the government and the citizens, a solution must take into the account the needs of both parties.

Located in Western Asia, Yemen was founded in 1918 after becoming independent of the Ottoman Empire and has a population of 27.5 million (“The World Factbook: YEMEN”). Yemen neighbors Saudi Arabia to the north, Oman to the east, the Gulf of Aden to the south, and the Red Sea to the west. With a hot, dry climate and desert gracing the land, agriculture can be difficult to expand in a developing country. Additionally, Yemenis struggle with limited water, overgrazing, soil erosion, and desertification. Out of 203,850 square miles, 4,600 square miles is cultivated and arable (“The World Factbook: YEMEN”). The typical family size in Yemen is 7.4 members, with an average of 6.67 births per woman. According to Robert Burrowes and Manfred Wenner, authors for the subscription database *Encyclopedia Britannica*, “[Culture](#) is intensely [patriarchal](#), and households usually consist of an [extended family](#) living in a single domicile or family [compound](#).” Homes are made of stone and mud, and families consume mainly rice, potatoes, eggs, vegetables, lamb, chicken, dates, tea, and sorghum. Chicken, goat, and lamb are primarily eaten, with beef being an expensive commodity in Yemen. The gross domestic product (GDP) per capita in Yemen for 2017 was \$2,300, and ranked 201 out of 228 reported by the Central Intelligence Agency (“Country Comparison :: GDP - Per Capita (PPP)”). With an urban population of 35.8% and a rural population of 64.2%, the majority of the population is employed in the agriculture sector or herding services. The primary religion in Yemen is Islamic. With the recent turmoil in Yemen, the bulk of the population has limited access to food, healthcare, or clean water. Yemenis are struggling to meet the daily needs to survive.

Yemenis use mixed-farming, where a household has an amount of both livestock and crops. Commercial production is not utilized in Yemen, as resources and technology are lacking. It proves a difficult task to farm efficiently when there is a “lack of arable land, scarcity of water, periodic droughts, and difficult terrain” to work with in Yemen (“Yemen - Agriculture”). Major crops of Yemen include sorghum, wheat, millet, maize, khat, coffee, mangos, plantains, bananas, papayas, and melons. Cash crops among these are khat, a stimulant much like tobacco, and coffee. Major exports include crude oil, natural gas, and fish. Many families raise their own livestock, consisting of chickens, goats, sheep, and cattle, yet the country must import livestock and dairy products to meet the needs of the country (“The World Factbook: YEMEN”). With an underdeveloped agriculture sector, Yemen spends more money on imports than they profit with exports, as they import the majority of their food and livestock. With a shortage of resources, certain breeds of livestock perform worse than others. Breeds that thrive under dry climates, poor nourishment and are disease-resistant with bigger carcasses would increase the agriculture sector in Yemen and decrease the starving population, and eventually regain some stability in Yemen. Raising domestic products would decrease the amount of global imports Yemen needs.

Yemen has always been a poor country, but with a recent government transition, the country is in its worst

state. With 50% of Yemenis working within agriculture, one could assume they would not have food insecurity, however, this statement is incorrect (“The World Factbook: YEMEN”). Yemen is at a disadvantage because of their terrain and climate. Yemen is mostly wasteland and desert, with a dry and hot climate. With such difficult geographic factors, Yemen imports millions of dollars in agricultural products. After a rebel group took over the government, currently 60% of the population has no idea where their next meal will come from. Yemenis in the civil service have not received income in months, negatively affecting the economy.

According to the United Nations, Yemen is now the largest food insecurity crisis in the world. This largely overlooked emergency is the result of a complicated civil war. The article “Yemen Crisis: Who Is Fighting Whom?”, published on January 30, 2018 by the British Broadcasting Company writes, stated “The conflict has its roots in the failure of a political transition supposed to bring stability to Yemen following an Arab Spring uprising that forced its longtime authoritarian president, Ali Abdullah Saleh, to hand over power to his deputy Abdrabbuh Mansour Hadi, in 2011.” Pressure from the Houthis, the rebel group consisting of the minority Shia, aided the Arab Spring. The Houthis promote pro-Iran and anti-Western, with a slogan of “Death to America, Death to Israel.” The Houthis have been a rebel group in Yemen since the 1990s that promoted religious traditions, but did not experience such limelight or power until 2011 (Schmitz). Houthis gained solidarity with Yemenis when Saudi Arabia lost influence (“Yemen Crisis: Who Is Fighting Whom?”). The Houthis took advantage of the political weakness and made their move. Houthis overthrew the capital, Sana’a, in September of 2014. Consequently, Hadi abandoned Yemen, leaving the Houthis in complete control.

Thus began a civil war. According to Mo Abbas, a reporter for NBC news, as of the week of December 23, 2017, the war hit a monumental 1,000-day reign over the failing country. Since the beginning of this war, the United Nations has tried to offer a peace deal three times, each ending in a flop. The war has inflicted disastrous complications to Yemenis. Linah Alsaafin, a journalist for news affiliate Al Jazeera, declares, “The fierce clashes also risk escalating the dire humanitarian crisis in the country, where out of a population of 28 million people, eight million are at risk of starvation, and 22 million depend on aid.” Healthcare has collapsed, with only 45% of facilities working. Margaret Besheer, reporter for *VOA News*, claims the world’s largest outbreak of cholera has been seen in hundreds of thousands of cases, caused by poor sanitation and spread by contaminated food and water in Yemen. One-third of all households only rely on bread, sugar, and oil to maintain their diet. Since 2014, 40% of Yemenis go to sleep hungry, with half of those not eating at all the previous day. Two million Yemenis, who have become “internally displaced” have become refugees. With this ongoing and unnoticed famine, Yemenis will continue to perish until a solution is found and implemented.

On top of malnutrition, airstrikes and raids continue to distress Yemen. Thousands of people continue to be wounded, killed, or displaced. Saudi military continues airstrikes and bombardment, with these attacks causing the majority of casualties (“Yemen Crisis: Who Is Fighting Whom?”). Aerial and naval blockades halt attempted aid and imported food. The one aspect that makes this situation worse is that fact that the United States is fueling the fire in Yemen by funding Saudi Arabia’s bombing, gasoline, and intelligence. The attacks have destroyed hospitals, schools, and infrastructure. This results in the destruction of economy, education, agriculture, and organization.

With no solution in sight and failed peace treaties, food insecurity in Yemen can still be solved, and quite possibly resolve some hostility. One can conclude that a solution must benefit the tumultuous government and the starving population. Without a solution for famine, millions will continue to be stunted and perish. With ports closed, the amount of food and humanitarian aid continue to decrease. The funds provided by the United States have contributed to this trend, along with the airstrikes and bombing that continues to ail the country. With no incoming salaries, food becomes difficult to produce and buy.

Yemen has relied heavily on imports and is now facing food insecurity without them. Since Yemen is unable to receive and afford imports, Yemenis must learn how to sustain agriculture.

Sheep, goats, and poultry are raised in Yemen. Thirty-three percent of Yemenis have sheep, with an average of 14 head per flock. Twenty-four percent of Yemen households have goats, with about 11 head. Yemen has many different breeds of sheep, all around 65 pounds at market weight. Some breeds of sheep in Yemen are Yemen, Dharmi, Boni, Jahrani, and Sukatri (Wilson). Throughout all breeds of market sheep, the hanging weight is 50%. Out of the 65-pound live weight, the hanging weight will be 33 pounds. In comparison, an average market lamb in the United States has a live weight of 135 pounds and a hanging weight of 68 pounds. With developing a more efficient breed, Americans are taking double the amount of carcass weight home when it comes to market lambs compared to Yemenis. The same situation happens with goats. A breed with a larger carcass with the same resistance to their environment would benefit Yemen. This being said, Dorper sheep need to be introduced to Yemen. Dorper sheep originated in South Africa in the 1930s, and are known to be maternal, adaptive, and reach a finishing weight of 80 pounds (“Breeds of Livestock, Department of Animal Science.”) With a larger carcass and the same traits as Yemen sheep right now, more meat would be produced for consumption. Dorper sheep prosper in South Africa, and can do the same in Yemen. Goats in Yemen are small, reaching market weights of 50 pounds. Breeds found in Yemen are Yemeni Mountain, Taiz Black, and the Mawr. Goats’ main purpose is milk, but they are also used for their meat and hair (Wilson). Similarly, introducing a larger goat carcass to Yemen would benefit meat production. The Boer goat originated from South Africa in the 1900s, and proves to be adaptive (“Boer Goat”). Does birth and milk easily, raising their kids to reach a market weight of 80-100 pounds. Boer goats can survive off dry conditions and gain weight quickly. Breeding rams can reach 200-300 pounds. Using these two breeds, meat consumption would increase. A variety of poultry is used and should be emphasized. Poultry can provide Yemenis with eggs and lean meat, both of which are rich with protein. Additionally, poultry provides an option that requires fewer resources, less time to reach market weight, and are fairly simple to raise.

Cattle are used in Yemen for meat, milk, power, fertilizer, and currency, but are owned in low numbers per household (Wilson). Seventy-five of households own cattle but only two head. The indigenous cattle breed is Yemeni Shorthorn Zebu. The average market weight for zebu cattle in Yemen is 450 pounds. In comparison, the average market weight of cattle in the United States is around 1200-1500 pounds. In America, the technology and strategies are effective and advanced, allowing Americans to bulk cattle up tremendously. Beef cattle’s dressed weight is around 62%. For example, a 1200-pound steer will have a 744-pound hanging carcass. Keeping this in mind, a 450-pound steer in Yemen is bringing in 279 pounds, whereas Americans take home triple the amount of carcass. Lightweight frames make zebus poor draft animals, especially when struggling with lack of nourishment (Wilson). With the introduction of a new breed, one with a bigger carcass and ability to handle harsh climates, Yemen’s food insecurity could be solved.

Christopher Columbus brought the Criollo cattle to America in the late 1400s. Cally Carswell, a reporter for *High Country News*, insists, “They required little water, subsisted on available forage, and could withstand hot weather.” Criollo are able to consume available vegetation. This breed would be able to produce more milk and meat, and be a better draft animal for the Yemenis because of their bigger carcass. Criollo are able to endure both extreme heat and cold, birth around twenty calves over their lifetime, have high rates of fertility, and are known to have fast-growing calves with ease (Carswell). With a more efficient breed, the supply of beef within the country should increase, therefore making beef a reasonable product for Yemenis to afford. With a lot of wasteland full of vegetation, Yemen could benefit from this breed of cattle. Introducing a more competent breed of cattle would open doors for a family to efficiently continue to use mixed-farming by implementing this breed of cattle in addition to the zebus, Yemen’s economy would increase and famine would decrease.

The use of a variety of animals comes with many benefits. One, different nutrients and proteins are gained when a diet has an array of options. Second, the production length varies on each market animal. Chickens take a short amount of time to reach market weight, followed by sheep and goats, with cattle taking the longest to reach market weight. With products reaching market weight at different intervals, an abundant amount of meat would be available year-round. Third, with the increase of market animals, byproducts will be readily available. Milk, skins and leather, bones, soaps, and insulin are all byproducts of these market animals. Fourth, the economy will benefit. With more meat to buy and sell, currency will be flowing more freely. To make this solution appealing to the government, taxation could be placed on the products, allowing the government to make money. More jobs will open up due to the diversity of product.

With more animals, more feed will be needed to keep this operation sustainable. While Yemen has enough wasteland with available vegetation for foraging, another solution can be proposed. Benjamin Kentish, writer for *The Independent*, claims “Scientists in China have developed several types of rice that can be grown in seawater, potentially creating enough food for 200 million people.” Being located next to the Gulf of Aden and the Red Sea, Yemen has an abundance of saltwater to use. Previously, freshwater was needed to grow rice, providing obstacles for some countries that lack freshwater. With this grain, countries who have access to saltwater can now cultivate an area for high-yielding rice. A genetically modified strain of rice that is saltwater-tolerant can be utilized in Yemenis to consume. Between harvest periods, market animals can forage on the crop residue. Criollo cattle, Dorper sheep, and Boer goats can all graze on the rice husks and straw that are left over from harvest. This makes the rice crop and livestock production more sustainable.

Technology continues to play a major role in developing nations, industrialized countries, and those in between. Technological advances have allowed the world to produce more food on the same amount of land. From plows to self-steering systems, agricultural technology has come a long way, and will be needed to solve Yemen’s food insecurity. In the US, we have become accustomed to the advances of technology, where Yemen is not. In the US we anticipate the use of drones, precision agriculture, highly selective breeding, and vertical farming. Similar to other struggling countries, Yemen is behind in the technological world and it will be a tough task to catch up. However difficult, it will be worthwhile. Modern technology will allow Yemen’s livestock and crops to stay hydrated and well-fed. Historically, Yemen has used spring irrigated systems, the use of pumped water, and spate irrigation, the use of flood water. A modern system of irrigation will be needed if the salt-water resistant rice is going to be grown in Yemen. The war in Yemen targeted this civil structure, however, making it difficult to irrigate water whatsoever. According to Kentish, the saltwater will need diluted before used in the fields for this rice. A seawater desalination plant will be needed in Yemen, as well. Expecting that Yemen will continue their use of mixed farming, large-scale technology, such as precision agriculture, is unnecessary and inappropriate for Yemen to prosper. Technology needed in Yemen for agriculture may seem “old-fashioned” compared to developing countries, but it will take individuals, communities, and government support in order for technology to boost agriculture in Yemen.

In summary, Yemen’s war has torn the country apart, but that does not mean people have to starve throughout the conflict. The basic needs of human life, food and water, must be met before conflict can be resolved in a country. Animal agriculture can be improved to make the country’s agriculture sector grow stronger and demand for imports decrease. With the help of introducing new breeds of market animals and a genetically modified, seawater-tolerant strain of rice, Yemen will benefit from the larger carcasses and rice production that will decrease the amount of famine in the country. As famine decreases, so will the hostility in Yemen, therefore ceasing the unrest in the country.

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